



Research Paper

## Does Corporate Governance Affect Productivity? Evidence from Private and Public Sector Banks in India

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### Abstract

Corporate governance is critical in the fast-growing Indian economy, particularly with so many contemporary examples of corporate collapses and mismanagement. Banking and governance have both seized the spotlight in India, but for reasons that are far from pleasant. With the enhanced focus of the Basel Committee on Banking Supervision, the prominence and distinctiveness of banking enterprises requires the necessity for sound corporate governance processes. The study attempts to examine the effect of corporate governance on Net Profit per Employee as a measure of productivity for the selected banks over a time span of ten years. Separately analysing a sample of ten private and public sector banks in India through panel regression, the study establishes that Board of Directors, Audit Committee, Risk Management and Fraud Monitoring Committee, Related Party Transactions and Corporate Governance Communication are significantly affecting Net Profit per Employee. Although the study's limitations make it difficult to generalise the findings, it does provide a solid foundation for future research.

### Keywords

Corporate Governance, Indian Banking Sector, Productivity, Net Profit per Employee, Panel Regression

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### I. INTRODUCTION

Modern organisations, which face frenetic turmoil in the face of accelerating globalisation and technological innovation, hyper-competition, startling financial breakthroughs, and a resurgent tide of worldwide mergers and acquisitions, have a greater need for productivity, consistency, and resilience. Regulators all across the world are rushing to evaluate the developments and navigate through the volatility (Sandeep et al., 2002). To prosper in liberalised settings, modern economies and enterprises require robust systems with solid governance and procedures (Kaheeru, 2001).

In the perspective of its possible role in boosting shareholder value and business performance, corporate governance has lately been the focus of key policy decisions and a highly publicised subject in the mainstream across all nations. The recent string of corporate failures, as well as repeated occurrences of mismanagement, self-dealing managerial activities, and the subsequent loss of confidence in corporate systems, has prompted regulatory agencies, corporations, and stakeholders to re-assess the importance of strict governance norms and standards. As a consequence, experts and organisations have refocused their efforts on examining the influence of corporate governance on business performance and stability (Khumani et al., 1998; Doidge et al., 2007; Zulkafli and Samad, 2007). Corporate governance refers to the procedures and mechanisms that oversee and govern an institution's business and operations in order to increase protracted shareholder value through improving business efficiency and effectiveness while also having taken other stakeholders' interests into consideration (Jenkinson and Mayer, 1992).

In light of the indispensable functions that they perform, such as providing payment solutions, ensuring cashflows, increasing financial inclusion, and most importantly, managing the risk, the financial sector,

monopolised by banks, forms the foundation of a nation's economic success. It is, therefore, necessary to protect the stability and security of these institutions, as well as their good governance, in view of the critical function they perform. The emphasis given by the Basel Committee on Banking Supervision's (BCBS) about the need to analyse and enhance the corporate governance standards of financial entities in general and banks in particular, supports the study of corporate governance and its impacts in relation to these unique financial institutions (De Andres and Vallelado, 2008).

The purpose of this research is to investigate the impact of corporate governance on productivity of the sampled private and public sector banks in India over a ten-year period from 2010-11 to 2019-20. The significance of the study is derived from the content and context, both of which contribute to its distinctiveness and results. The present body of work conducts a preliminary inquiry so as to expand the research on corporate governance in the Indian banking industry, which has captured the attention owing to its dynamism, robustness, and sheer volume despite recurrent financial crises in the global arena. Furthermore, the growing volume of bad assets raising concerns about the stability and efficiency of Indian banking heavyweights, alongside myriads of controversial dealings, have called into question the significance and effectiveness of corporate governance in banks.

### **Corporate Governance and Banks**

Banking is a crucial sector of the economy as far as supply of finance to commercial firms, essential financial services to a large proportion of the population and access to payment services are concerned (Barua & Barua, 2020). The significance of banks to country's economy is highlighted by the fact that they are, almost worldwide, a highly regulated business and that they have access to the government safety net. It is of essential significance consequently that banks have good governance standards (Eissa A et al., 2021). Banks are also significant drivers for economic changes, particularly corporate governance policies and procedures. Due to the inevitable role of banks, the integration of corporate governance standards in the evaluation of credit risks relevant to the loan process would motivate the corporate sector in response to strengthen their internal corporate governance procedures (Arun & Turner, 2004). Significance of applying current corporate governance standards is characterised by the worldwide trend of consolidation in the banking industry and a necessity of greater capitalisation (Paulet, 2011). The question that has to be addressed here is, how essential is the subject of corporate governance in banks and other financial organisations. Banks, much like any other organisation are well established entities and as a consequence of this, the essential standards of corporate governance extend to them as any other established organisation. Coupled with this, some elements that are highly peculiar to banks, further add to the relevance of Corporate Governance concerns in banks.

Among other characteristics, the most essential one is the premise that banks represent an essential component of the economy of the nation and any collapse in a bank may have a substantial influence on the financial health of the nation. Banks aid in directing and facilitating the savings of the population (Stiglitz, 1999).

In two aspects, the capital structure of a bank is distinctive. To begin with, banks have a low level of equity in comparison to other businesses. Second, banks' obligations are primarily in the form of deposits, which are readily accessible to creditors/depositors, but their assets are mostly in the form of longer-term loans. As a result, the primary feature that distinguishes banks as financial intermediaries is their ability to provide liquidity. Banks provide liquidity for the business ecosystem by preserving illiquid assets and releasing liquid liabilities (Diamond & Dybvig, 1983; Peia & Vranceanu, 2019). Since banks only retain a percentage of deposits on reserve at any given point, the liquidity creation function may pose a collective-action dilemma among the account holders (Abowd & Kaplan, 1999). Account holders will not be able to get immediate reimbursement of their deposits since the bank will not have enough money on hand to do so. In the unusual situation of a bank run, this imbalance between deposits and obligations creates a hazard. (Maher & Andersson, 2000; Anginer & Demirgüç-Kunt, 2018).

The financing patterns of a bank is the second essential determinant of strong corporate governance. Banks are, by design, highly leveraged financial enterprises, with the equity capital of the owners limited to a small fraction of debt capital in the form of borrowed money and savings from the account holders. As a consequence, bank stakeholders, particularly depositors and lenders, have a legitimate claim towards commitment from banks' management particularly their boards of directors. (Caprio & Levine, 2002; Handa, 2018).

The control function is the third crucial component of the Corporate Governance system in banks. Internal and external irregularities are dealt with by banks' control functions (Claessens & Jansen, 2000; Lin, 2017). Internal irregularities refer to instances in which a bank's own employees engage in immoral or unethical behaviour while external irregularity is concerned with circumstances in which bank customers attempt to find evidence of wrongdoing. The consequences of external malpractices are so severe that particular intervention is necessitated for both their avoidance and post-occurrence assessment (Gorton, 1994). In this regard, it is worth

recalling the COSO framework, which was created to achieve this objective. (Gorton et al., 1994; Thabit et al., 2017; Udeh, 2019; Park et al., 2021).

Lastly, failure to follow established guidelines might be one of the most difficult aspects of the Corporate Governance regime. With the central bank and other regulatory agencies keeping a close eye on banks, it is a frequent remark that the majority of bank collapses have transpired as a result of compliance problems (Jensen & Meckling, 1976). Failure to comply with regulatory requirements has never been done away with, despite the introduction of several assessments and regulations, one of which being the Basel II guidelines. At this point, it is critical to evaluate the influence that governments exert on the governance of banks, as well as the relevance of government intervention in banks. (La Porta et al., 1999).

The involvement of a public money also gives rise to the risk of malpractice and self-dealing in the banking sector when the provisions for monitoring are relaxed. In the 1980s, it was believed that one-third of banking crises occurred owing to fraudulent activities and self-dealing operations (Clarke, 1988). According to a comparable estimate, insider lending was responsible for a majority of bank runs between early 1990s (Jackson & Symons, 1999), as well as non-performing loans (Tacneng, 2015; Prasanth et al., 2020). Obviously, unethical conduct is possible in any huge company, since it is inconvenient for the ownership to watch all personnel at the very same time. Nevertheless, owing to the fact that a major share of banking institutions' assets is stored in relatively liquid state, these issues are especially severe (Maher & Andersson, 2000).

### **Data, Variables and Methodology**

The present study is a preliminary effort to explore the corporate governance variables in banking organisations and their effect on productivity of banks in terms of Net Profit per Employee. The study aims to compare the relationship between corporate governance and employee productivity of private and public sector banks in India.

The study is based on secondary data which is collected from various reports, especially, the annual reports of the selected banks. The data is collected for a period of ten financial years from 2010-11 to 2019-20. Given below is the list of selected private and public sector banks included in the study.

**Table 01: List of Sampled Private and Public Sector Banks**

<b>##</b>	<b>Private Sector Banks</b>	<b>Public Sector Banks</b>
01	HDFC Bank	State Bank of India
02	ICICI Bank	Punjab National Bank
03	Axis Bank	Bank of Baroda
04	IndusInd Bank	Canara Bank
05	Kotak Mahindra Bank	Union Bank of India
06	Yes Bank	Bank of India
07	IDBI Bank	Indian Bank
08	IDFC First Bank	Central Bank
09	Federal Bank	Indian Overseas Bank
10	Bandhan Bank	UCO Bank

The Reserve Bank of India segregates all the banks operating in India into eight major categories i.e., Private Sector Banks, Local Area Banks, Small Finance Banks, Payments Banks, Public Sector Banks, Financial Institutions, Regional Rural Banks and Foreign Banks. For the purpose of the study, Indian banks, particularly belonging to the private and public sector have been taken into consideration. Thus, the private and public sector banks operating in India constitute the population for this study. The present study has covered the top ten banks in each category for specific results. The top ten banks were chosen on the basis of their deposit market share. Deposits being an important criterion to determine market share of banks, the top ten banks in each of the two categories i.e., private and public sector have been determined in terms of the deposits held by them in the financial year ending 2019-20. Thus, the top ten private and public sector commercial banks in India constitute the sample of this study.

The study covers eleven major variables that are deemed to be important: Board of Directors (BOD); Audit Committee (ADC); Nomination and Remuneration Committee (NRC); Stakeholders Relationship Committee (SRC); Risk Management and Fraud Monitoring Committee (RMC); Policy on Related Party Transactions (RPT); General Body Meetings (GBM); Corporate Governance Disclosures (CGD); Corporate Governance Communication (CGC); General Shareholder Information (GSI); and Corporate Social Responsibility and Sustainability (CSR). These major variables of Corporate Governance are the Independent Variables of the study and have been identified on the basis of various national and international corporate governance codes. The Revised Clause 49 of Listing Agreement of SEBI (2014); New Companies Act 2013; Recommendations from different national and international committees on Corporate Governance; and prior studies are used to identify the key corporate governance variables for the purpose of the present study. Again, each of the eleven variables constitute a number of sub-variables. These sub-variables have been quantified by using an approach which is both Dichotomous (through the assignment of two numerical values i.e., 0 or 2) and Trichotomous (through the assignment of three numerical values i.e., 0 or 1 or 2).

The dependent variable of the study is productivity. Net Profit per Employee (NPE) has been considered as a measure of productivity (Vadrane&Katti, 2018). This ratio is calculated by dividing a company's net income with the number of employees (Kumar, 2014). This ratio indicates how efficient the company is with its employees. Theoretically, the higher the ratio the better. In the words of Bryan (2007), writing in the McKinsey Quarterly, "To boost the potential for wealth creation, strategically minded executives must embrace a radical idea: changing financial-performance metrics to focus on returns on talent rather than returns on capital alone." This indicates that a firm should consider not only the profit generated by the money of shareholders, but also the profits generated by the efforts of the employees who are engaged in the firm and convert the shareholders' money into profit.

The study employs panel data which has been analysed through Stata by using panel regression models (Pooled OLS Model, Fixed-effects Model, Random-effects Model). Through panel regression, the researcher intends to ascertain the effect of Corporate Governance mechanisms on the productivity of employees for the sampled banks with predefined independent variables and Net Profit per Employee as the dependent variable. The research has divided the sampled banks into two groups i.e., private sector banks and public sector banks. Accordingly, the following hypotheses have been formed in their null forms.

**H<sub>01</sub>:** There is no significant effect of Corporate Governance on Net Profit per Employee (NPE) of Private Sector banks.

**H<sub>02</sub>:** There is no significant effect of Corporate Governance on Net Profit per Employee (NPE) of Public Sector banks.

The regression model for this association is:  $NPE_{it} = \alpha + \beta_1 (BOD)_{it} + \beta_2 (ADC)_{it} + \beta_3 (NRC)_{it} + \beta_4 (SRC)_{it} + \beta_5 (RMC)_{it} + \beta_6 (RPT)_{it} + \beta_7 (GBM)_{it} + \beta_8 (CGD)_{it} + \beta_9 (CGC)_{it} + \beta_{10} (GSI)_{it} + \beta_{11} (CSR)_{it} + \epsilon_{it}$

Where, Net Profit per Employee (NPE) is the dependent variable denoting productivity of bank i in year t,  $\alpha$  is constant term,  $\beta$  is coefficient of variables,  $\epsilon_{it}$  is error term, and BOD, ADC, NRC, SRC, RMC, RPT, GBM, CGD, CGC, GSI and CSR are the independent variables collectively denoting corporate governance.

### Results in Respect of Private Sector Banks

The OLS process has been selected by taking NPE as response variable and result of pooled OLS model (Table 02). Due to limitation of pooled OLS model, other econometric models i.e., fixed and random effects models are also applied after conducting the tests for Normality, Multicollinearity, Heteroskedasticity and Auto Correlation. White's test is applied to check heteroskedasticity problem (Table 03). The result of the White's test shows that data is homoskedastic as p value (0.1287) is greater than 0.05, so null hypothesis for data homoskedasticity is accepted.

**Table 02: Pooled OLS Model for Private Sector Banks**

Source	SS	df	MS	Number of obs	=	90
-----+-----				F(11, 78)	=	2.60
Model	1667.66319	11	151.605744	Prob > F	=	0.0048
Residual	8032.64777	78	58.2075925	R-squared	=	0.3719
-----+-----				Adj R-squared	=	0.1059
Total	9700.31096	89	65.1027581	Root MSE	=	7.6294

NPE	Coef.	Std.Err.	t	P> t	[95% Conf.Interval]
BOD	.1694631	.2145686	0.790	.431	-.2548042 .5937304
ADC	-.080647	.4143785	-0.190	.846	-.8999999 .7387051
NRC	.1850748	.370124	0.500	.618	-.5467727 .9169224
SRC	.6709214	.3545492	1.890	.061	-.0301299 1.371973
RMC	-1.038183	.497012	-2.090	.039	-2.020927 -.0554395
RPT	-2.0064991	.134936	-1.770	.079	-4.250612 .2376141
GBM	.0376169	.7501395	0.050	.960	-1.445637 1.52087
CGD	.4717938	.2589862	1.820	.071	-.0403004 .9838881
CGC	-1.94632	.8832499	-2.200	.029	-3.692773 -.1998668
GSI	-.1632655	.2473076	-0.660	.510	-.6522678 .3257367
CSR	1.34601	.7794837	1.730	.086	-.1952659 2.887286
_cons	-7.2615584	.572502	-1.590	.115	-16.30278 1.779667

Table 03: White's test for Private Sector Banks

White's test for Ho: homoskedasticity  
against Ha: unrestricted heteroskedasticity

chi2(77) = 109.58  
Prob > chi2 = 0.1287

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p	
				Heteroskedasticity  109.58
	77	0.1287		
Skewness	21.01	11	0.0733	
Kurtosis	2.08	1	0.1490	
				Total  132.68 89
	0.1019			

To check the autocorrelation problem, Wooldridge test (Table 04) is performed. The p value (0.0769) is more than 0.05, so null hypothesis stating that there is no first order serial correlation, is accepted. Thus, no first order serial correlation is found in the data.

Table 04: Wooldridge Test for Private Sector Banks

Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation  
F( 1, 9)= 3094.157  
Prob >F= 0.0769

Table 05: Fixed-effects Model for Private Sector Banks

Fixed-effects (within) regression                      Number of obs        =        90  
Group variable: Bank                                      Number of groups    =        10

R-sq:		Obs per group:				
within	= 0.5785			min	=	10
between	= 0.1230			avg	=	10.0
overall	= 0.4571			max	=	10
F(11,78)	=					4.35
corr(u_i,Xb)	= -0.6415			Prob >F	=	0.0000

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NPE	Coef.	Std.Err.	t	P> t	[95% Conf.Interval]
BOD	.4211233	.3979439	1.06	0.292	-.3665192 1.208766
ADC	.7530323	.5566176	1.35	0.179	-.3486699 1.854735
NRC	.0425288	.4737253	0.09	0.929	-.8951062 .9801639
SRC	2.258111	.5978903	3.78	0.000	1.074719 3.441503
RMC	-1.651128	.5815065	-2.84	0.005	-2.802092 .5001636
RPT	-1.588225	1.197702	-1.33	0.187	-3.958813 .7823632
GBM	-1.460795	.8251822	-1.77	0.079	-3.094061 .1724722
CGD	-.3067057	.3983468	-0.77	0.443	-1.095145 .4817341
CGC	-2.088044	.8799211	-2.37	0.019	-3.829654 .3464337
GSI	-.0210819	.3369547	-0.06	0.950	-.6880097 .645846
CSR	.8107797	.8819674	0.92	0.360	-.9348809 2.55644
_cons	-9.704734	4.804449	-2.02	0.046	-19.21408 .1953847

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sigma_u	6.1678203
sigma_e	6.9631502
rho	.43965238 (fraction of variance due tou_i)

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F test that all u_i=0:	F(11, 78)=2.98	Prob > F =0.0006
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**Table 06: Random-effects Model for Private Sector Banks**

Random-effects GLS regression	Number of obs	=	90
Group variable: Bank	Number of groups	=	10

  

R-sq:		Obs per group:				
within	= 0.6868			min	=	10
between	= 0.1513			avg	=	10.0
overall	= 0.3719			max	=	10

  

Wald chi2(11)	=					28.65
corr(u_i,X)	=0 (assumed)			Prob >chi2	=	0.0026

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NPE	Coef.	Std.Err.	z	P> z	[95% Conf.Interval]
BOD	1.169463	.2145686	1.790	.043	-.2510837 .5900099
ADC	.880647	.4143785	1.190	.046	-.8928139 .7315199
NRC	.1850748	.370124	0.500	.617	-.5403549 .9105046
SRC	.6709214	.3545492	1.890	.058	-.0239822 1.365825
RMC	1.038183	.497012	2.090	.037	-2.012309 -.0640575
RPT	-2.006499	1.134936	-1.770	.047	-4.230933 .2179349
GBM	.0376169	.7501395	0.050	.960	-1.43263 1.507863
CGD	.4717938	.2589862	1.820	.069	-.0358097 .9793974
CGC	-1.94632	.8832499	-2.200	.128	-3.677458 -.215182



GSI	-.1632655	.2473076	-0.660.509	-.6479795	.3214485
CSR	1.34601	.7794837	1.730.084	-.18175	2.87377
_cons	1.261558	1.572502	1.590.112	-16.2235	1.700382
-----+					
sigma_u	0				
	sigma_e	6.9631502			
rho	0 (fraction of variance due tou_i)				
-----					

The summary of Fixed-effects Model (Table 05) and Random-effects Model (Table 06) are given above. Hausman Specification Test (Table 07) is applied to choose the most appropriate model between fixed and random effects model. The p value (0.0988) is more than alpha value 0.05, so null hypothesis stated that difference in coefficients is not systematic, is accepted. It means that random-effects model is more appropriate than fixed-effects model. To make comparison between random-effects model and pooled OLS model, Lagrangian Multiplier test (Table 08) is conducted. The p value (0.0091) is less than 0.05, so it is not possible to accept the null hypothesis indicating that pooled OLS model is appropriate. It is found that Random-effects Model is more appropriate than the other two econometric models.

**Table 07: Hausman Test for Private Sector Banks**

---- Coefficients ----				
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fixed	random	Difference	S.E.
-----+				
BOD	.4211233	1.169463	-.7483397	.3351413
ADC	.7530323	.880647	-.1276147	.3716365
NRC	.0425288	.1850748	-.142546	.2956752
SRC	2.258111	.6709214	1.58719	.4814225
RMC	-1.651128	1.038183	-2.689311	.3018756
RPT	-1.588225	-2.006499	.4182745	.3826357
GBM	-1.460795	.0376169	-1.498411	.343826
CGD	-.3067057	.4717938	-.7784995	.3026653
CGC	-2.088044	-1.94632	-.1417239	.2780667
GSI	-.0210819	-.1632655	.1421836	.2288612
CSRS	.8107797	1.34601	-.5352302	.41264

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(11) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

= 76.74  
 Prob>chi2= 0.0988

**Table 08: LM Test for NPE; Private Sector Banks)**

Breusch and Pagan Lagrangian multiplier test for random effects NPE[Bank,t] = Xb + u[Bank] + e[Bank,t]

Estimated results:

	Var	sd =sqrt(Var)
-----+		
NPE	65.10276	8.068628
e	48.48546	6.96315

u	0	0	
Test:	Var(u) = 0		
chibar2(01)=		0.00	
	Prob > chibar2 =		0.0091

The p value (0.0026) is less than 0.05 (level of significance), so, null hypothesis stating that there is no significant impact of corporate governance on NPE in private sector banks, is rejected. And it is observed that corporate governance has a significant role in determining NPE. The R-Squared value is found to be 0.6868, which means that 68.68 percent of the variation in the NPE is explained by the all the regressors. Regressors BOD (1.169463), ADC (0.880647), RMC (1.038183), and RPT (-2.006499) are significantly affecting NPE of selected private sector banks which is evident in result that their p value is less than 0.05 as shown by z test of significance. The coefficient of RPT is observed to be negative which indicates that it is having negative impact on NPE of selected private sector banks. Other regressors i.e. NRC, SRC, GBM, CGD, CGC, GSI and CSR are not significantly affecting NPE as their p value is more than 0.05.

### Results in Respect of Public Sector Banks

To run a combined regression using OLS estimator, all the observations have been pooled by taking NPE as response variable (Table 09). Other econometric models i.e., fixed and random effects models are also applied after conducting the tests for Normality, Multicollinearity, Heteroskedasticity and Auto Correlation.

**Table 09: Pooled OLS Model for Public Sector Banks**

Source	SS	df	MS	Number of obs	=	100
-----+-----				F(11, 88)	=	4.34
Model	3841.96454	11	349.269504	Prob > F	=	0.0000
Residual	18357.4735	88	80.5152348	R-squared	=	0.1731
-----+-----				Adj R-squared	=	0.1332
Total	22199.4381	99	92.8846782	Root MSE	=	8.973

  

NPE	Coef.	Std.Err.	t	P> t	[95% Conf.Interval]
-----+-----					
BOD	.2208031	.1359631	1.620	.106	-.0471018 .488708
ADC	-.1185116	.2762721	-0.430	.668	-.6628846 .4258614
NRC	.5276132	.2774573	1.900	.058	-.0190952 1.074322
SRC	-.2088641	.2028932	-1.030	.304	-.6086495 .1909214
RMC	-.4690572	.3344048	-1.400	.162	-1.127976 .1898618
RPT	.174288	.7922214	0.220	.826	-1.386723 1.735299
GBM	-1.487742	.3891548	-3.820	.000	-2.254542 -.7209421
CGD	.3878604	.1565373	2.480	.014	.0794157 .6963052
CGC	.9792519	.5686508	1.720	.086	-.1412307 2.099735
GSI	-.0460982	.1760916	-0.260	.794	-.3930732 .3008767
CSR	.2307746	.4717352	0.490	.625	-.6987435 1.160293
_cons	-4.6893624	.016383	-1.170	.244	-12.60334 3.224612

White's test is applied to check heteroskedasticity problem (Table 10). The result shows that data is homoskedastic as p value (0.5244) is greater than 0.05, so null hypothesis for data homoskedasticity is accepted.

**Table 10: White's test for NPE; Public Sector Banks**

White's test for Ho: homoskedasticity  
against Ha: unrestricted heteroskedasticity

chi2(77)	=	138.15
Prob > chi2	=	0.5244



Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p	
	77	0.5244		Heteroskedasticity   138.15
Skewness	41.49	11	0.0866	
Kurtosis	6.42	1	0.1113	
				Total   186.05 89
	0.0000			

**Table 11: Wooldridge Test for NPE; Public Sector Banks**

Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation	
F( 1, 9)=	1219.887
Prob >F=	0.2863

To check the autocorrelation problem, Wooldridge test (Table 11) is performed. The p value (0.2863) is more than 0.05, so null hypothesis stated that there is no first order serial correlation, is accepted. Thus, no first order serial correlation is found in the data.

**Table 12: Fixed-effects Model for NPE; Public Sector Banks**

Fixed-effects (within) regression	Number of obs =	100			
Group variable: Bank	Number of groups =	10			
R-sq:	Obs per group:				
within = 0.3193	min =	10			
between = 0.0165	avg =	10.0			
overall = 0.0821	max =	10			
F(11,88) =		8.74			
corr(u_i,Xb) = -0.0080	Prob >F =	0.0000			
NPE	Coef.	Std.Err.	t	P> t	[95% Conf.Interval]
BOD	.3287764	.0940362	3.50	0.001	.1433743 .5141785
ADC	-.065648	.1785002	-0.37	0.713	-.4175796 .2862836
NRC	.3286187	.1623185	2.02	0.044	.008591 .6486464
SRC	.0221321	.1228436	0.18	0.857	-.2200668 .2643309
RMC	.0026383	.161959	0.02	0.987	-.3166807 .3219573
RPT	-.1651213	.4059294	-0.41	0.685	-.965453 .6352104
GBM	-.4337368	.2296378	-1.89	0.060	-.8864915 .0190179
CGD	-.1572954	.0918667	-1.71	0.088	-.3384201 .0238293
CGC	.6286498	.3064583	2.05	0.042	.0244356 1.232864
GSI	.1358005	.1011599	1.34	0.181	-.0636468 .3352478
CSR	.4219735	.2306483	1.83	0.069	-.0327735 .8767204
_cons	-6.415463	2.186184	-2.93	0.004	-10.72575 -2.105174
sigma_u	8.6216219				
sigma_e	4.0010768				

rho| .82279785 (fraction of variance due tou\_i)  
 -----  
 F test that all u\_i=0: F(11, 88)=40.94 Prob > F =0.0000

**Table 13: Random-effects Model for NPE; Public Sector Banks**

Random-effects GLS regression	Number of obs	=	100			
Group variable: Bank	Number of groups	=	10			
R-sq:	Obs per group:					
within = 0.6190	min	=	10			
between = 0.0241	avg	=	10.0			
overall = 0.1881	max	=	10			
Wald chi2(11)	=	98.29				
corr(u_i,X)	=0 (assumed)	Prob >chi2	= 0.0065			
-----						
NPE	Coef.	Std.Err.	z	P> z	[95% Conf.Interval]	
-----						
BOD	.3259316	.0917452	3.55	0.012	.1461144	.5057488
ADC	-.0746969	.174787	-0.43	0.669	-.4172731	.2678794
NRC	.3260399	.1595845	2.04	0.041	.0132599	.6388198
SRC	1.0179382	.1206201	0.15	0.037	-.2184728	.2543492
RMC	-.0088501	.160229	-0.06	0.956	-.3228931	.3051929
RPT	-1.1531025	.4009708	-0.38	0.003	-.9389909	.6327858
GBM	-.4699148	.2259025	-2.08	0.238	-.9126755	-.0271541
CGD	-.1398718	.090187	-1.55	0.121	-.316635	.0368915
CGC	.6439955	.3018631	2.13	0.033	.0523548	1.235636
GSI	.1325261	.099394	1.33	0.182	-.0622825	.3273347
CSR	.4164897	.2281144	1.83	0.068	-.0306063	.8635856
_cons	-6.360856	2.872499	-2.21	0.327	-11.99085	-.7308619
-----						
sigma_u	9.3944592					
sigma_e	4.0010768					
rho	.44646146	(fraction of variance due tou_i)				
-----						

The summary of Fixed-effects Model (Table 12) and Random-effects Model (Table 13) are given above. Hausman Specification Test (Table 14) is applied to choose the most appropriate model between fixed and random effects models. The p value (0.9976) is more than alpha value 0.05, so null hypothesis stating that difference in coefficients is not systematic, is accepted. It means that Random effects model is more appropriate than fixed effects model. To make comparison between Random-effects model and Pooled OLS model, Lagrangian Multiplier test (Table 15) is conducted. The p value (0.0019) is less than 0.05, so it is not possible to accept the null hypothesis indicating that pooled OLS model is appropriate. It is found that Random-effects Model is more appropriate than the other two econometric models.

**Table 14: Hausman Test for NPE; Public Sector Banks**

---- Coefficients ----				
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
BOD	.3287764	.3259316	.0028448	.0206308
ADC	-.065648	-.0746969	.0090489	.036219
NRC	.3286187	.3260399	.0025789	.029666
SRC	.0221321	1.0179382	-.9958061	.0232667
RMC	.0026383	-.0088501	.0114884	.0236095
RPT	-.1651213	-1.1531025	.9879812	.0632538
GBM	-.4337368	-.4699148	.036178	.0412505
CGD	-.1572954	-.1398718	-.0174236	.0174871
CGC	.6286498	.6439955	-.0153457	.0528711
GSI	.1358005	.1325261	.0032744	.0188194
CSR	.4219735	.4164897	.0054838	.0340947

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients notsystematic

$$\text{chi2}(11) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 2.22$$

$$\text{Prob} > \text{chi2} = 0.9976$$

**Table 15: LM Test for NPE; Public Sector Banks**

Breusch and Pagan Lagrangian multiplier test for random effects  $NPE[\text{Bank},t] = Xb + u[\text{Bank}] + e[\text{Bank},t]$

Estimated results:

	Var	sd =sqrt(Var)
NPE	92.88468	9.63767
e	16.00862	4.001077
u	88.25586	9.394459

Test:  $\text{Var}(u) = 0$   
 $\text{chibar2}(01) = 578.21$   
 $\text{Prob} > \text{chibar2} = 0.0019$

The p value (0.0065) is less than 0.05 (level of significance), so, null hypothesis stating that there is no significant impact of corporate governance on NPE in public sector banks, is rejected. It means that corporate governance has a significant role in determining NPE. The R-Squared value is found to be 0.6190, which means that 61.90 percent of the variation in the NPE is explained by the all the regressors. Regressors BOD (0.3259316), NRC (0.3260399), SRC (1.0179382), RPT (-1.1531025) and CGC (0.6439955) are significantly affecting NPE of selected public sector banks which is evident in result that their p value is less than 0.05 as shown by z test of significance. The coefficient of RPT is observed to be -1.1531025 which indicates that it is having negative impact on NPE of selected public sector banks. Regressors ADC, MC, GBM, CGD, GSI and CSR are not significantly affecting NPE as their p value is not less than 0.05.

## II. CONCLUSION

The importance of corporate governance research in today's world of authoritative laws, strong competition, and worrisome regularity of banking industry frauds has prompted this study. The current study is an attempt in the correct direction, given the prominence of corporate governance in financial research and the major worldwide position inhabited by the Indian economy. The very focus of the current study namely the

Indian banking sector, its volumes and its intensity during and after the recent worldwide catastrophe, adds to its importance. Over a ten-year period, a preliminary attempt has been made to assess the effectiveness and impact of corporate governance on productivity for some of India's largest private and public sector banks.

In the context of private sector banks, the null hypothesis that there is no significant influence of corporate governance on NPE is rejected since the p value (0.0026) is less than 0.05, as shown in Random Effects Table. It demonstrates the importance of corporate governance in productivity. The coefficient of determination is 0.6868, which means that all of the regressors account for 68.68 percent of the variation in the NPE. Board of Directors (1.169463), Audit Committee (0.880647), Risk Management & Fraud Monitoring Committee (1.038183), and Related Party Transactions (-2.006499) are the regressors that have a significant impact on productivity of selected private sector banks, as evidenced by their p value being less than 0.05 as determined by the z test of significance. Related Party Transactions has a negative coefficient, indicating that it has a negative influence on productivity of selected private sector banks.

In the context of public sector banks, the null hypothesis that there is no significant influence of corporate governance on NPE is rejected since the p value (0.0065) is less than 0.05, as shown in Random Effects Table. It demonstrates the importance of corporate governance in productivity. The coefficient of determination is 0.6190, which means that all of the regressors account for 61.90 percent of the variation in the NPE. Board of Directors (0.3259316), Nomination and Remuneration Committee (0.3260399), Stakeholders' Relationship Committee (1.0179382), Related Party Transactions (-1.1531025), and Corporate Governance Communication (0.6439955) are regressors that have a significant impact on productivity of selected public sector banks, as evidenced by the fact that their p value is less than 0.05, as shown by the z test of significance. Related Party Transactions has a negative coefficient, indicating that it has a negative influence on productivity of selected public sector banks.

As already mentioned, the data was analysed over ten years and for different banks using panel regression analysis, and it was discovered that corporate governance has an impact on productivity. However, the small sample size of the study necessitates a more thorough analysis to ensure that the findings are generalisable. To get reliable findings, further study using other productivity metrics and larger representative samples is necessary. The current work may be seen as an initial attempt to investigate the consequences of corporate governance in India's public and private sector banks, which are usually left out of studies owing to their complexity, operational inconsistencies and regulatory disparities. Even though the banking sector is distinctive from other non-financial entities, it cannot be ignored in corporate governance research.

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